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# 1987

## Census of Manufactures

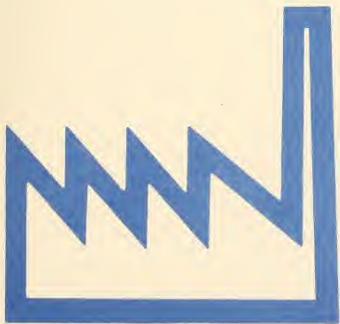
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MC87-A-9

GEOGRAPHIC AREA SERIES

## District of Columbia

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The overall planning and review of the census operations were performed by the staff of the Office of the Assistant Director for Economic and Agriculture Censuses.

This report was prepared in the Industry Division. **John Govoni**, Assistant Chief for Census/ASM Programs, was responsible for the overall planning, management, and coordination of the census of manufactures. Planning and implementation were under the direction of **Bruce Goldhirsch**, Chief, Special Reports Branch, with primary data analysis responsibilities performed by **Julius Smith**.

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If you have any questions concerning the statistics in this report, call (301) 763-1503.

# 1987

## Census of Manufactures

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# INTRODUCTION

## PURPOSE AND USES OF THE ECONOMIC CENSUSES

The economic censuses are the major source of facts about the structure and functioning of the Nation's economy. They provide essential information for government, business, industry, and the general public.

*Economic censuses furnish an important part of the framework for such composite measures as the gross national product, input-output measures, production and price indexes, and other statistical series that measure short-term changes in economic conditions.*

*Policy-making agencies of the Federal Government use the data, especially in monitoring economic activity and providing assistance to business.*

*State and local governments use the data to assess business activities and tax bases within their jurisdictions and to develop programs to attract business.*

*Trade associations study trends in their own and competing industries, and keep their members informed of market changes.*

*Individual businesses use the data to locate potential markets and to analyze their own production and sales performance relative to industry or area averages.*

## AUTHORITY AND SCOPE

Title 13 of the United States Code (sections 131, 191, and 224) directs the Census Bureau to take the economic censuses every 5 years, covering years ending in 2 and 7. The 1987 Economic Censuses consist of the

- Census of Retail Trade
- Census of Wholesale Trade
- Census of Service Industries
- Census of Transportation
- Census of Manufactures
- Census of Mineral Industries
- Census of Construction Industries

Special programs also cover enterprise statistics and minority-owned and women-owned businesses. (The 1987 Census of Agriculture and 1987 Census of Governments are conducted separately.) The next economic censuses are scheduled to be taken in 1993 covering the year 1992.

## AVAILABILITY OF THE DATA

The results of each of the economic censuses are available in printed reports, for sale by the U.S. Government Printing Office, and on microfiche, computer tape, compact discs with read-only memory, and flexible diskettes, for sale by the Census Bureau. Order forms for all types of products are available on request from Customer Services, Census Bureau, Washington, DC 20233. A more complete description of publications being issued from this census is on the inside back cover of this document.

Census facts are also widely disseminated by trade associations, business journals, and newspapers. Volumes containing census statistics are available in most major public and college libraries. Finally, State Data Centers in every State and Business and Industry Data Centers in many States also supply economic census statistics.

## WHAT'S NEW IN 1987

Several changes have taken place for the 1987 censuses. Data will be reported on the basis of the newly revised Standard Industrial Classification (SIC) system with selected reports including "bridge tables," linking the old and new classification systems. A new set of metropolitan areas has been adopted, and more detailed information will be available for businesses with no paid employees. For additional information on these changes, review the subsequent text.

## HISTORICAL INFORMATION

The economic censuses have been taken together as an integrated program at 5-year intervals since 1967, and before that for 1963, 1958, and 1954. Prior to that time, the individual censuses were taken separately at varying intervals.

The economic censuses trace their beginnings to the 1810 Decennial Census, when questions on manufacturing were included with those for population. Coverage of economic activities was expanded for 1840 and subsequent censuses to include mining and some commercial

activities. In 1902, Congress established a permanent Census Bureau and directed that a census of manufactures be taken every 5 years. The 1905 manufactures census was the first time a census was taken apart from the regular every-10-year population census.

The first census of business was taken in 1930, covering 1929. Initially it covered retail and wholesale trade, and construction industries, but it was broadened in 1933 to include some of the service trades.

The 1954 economic censuses were the first to be fully integrated—providing comparable census data across economic sectors, using consistent time periods, concepts, definitions, classifications, and reporting units. These were the first censuses to be taken by mail, using lists of firms provided by the administrative records of other federal agencies. Since 1963, administrative records have also been used to provide basic statistics as well for very small firms, reducing or eliminating the need to send them census questionnaires. The Enterprise Statistics Program, which publishes combined data from the economic censuses, was made possible with the implementation of the integrated census program in 1954.

The range of industries covered in the economic censuses has continued to expand. The Census of Construction Industries began on a regular basis in 1967, and the scope of service industries was broadened in 1967, 1977, and 1987. The Census of Transportation began in 1963 as a set of surveys covering travel, transportation of commodities, and trucks. New for 1987 are publications reporting on business establishments engaged in several transportation industries, paralleling the data on establishments in other sectors. This is part of a gradual expansion in coverage of industries previously subjected to government regulation. The Survey of Minority-Owned Business Enterprises was first conducted as a special project in 1969 and was incorporated into the economic censuses in 1972 along with the Survey of Women-Owned Businesses.

Economic censuses have also been taken in Puerto Rico since 1909, in the Virgin Islands and Guam since 1958, and in the Northern Mariana Islands since 1982.

Statistical reports from the 1982 and earlier censuses provide historical figures for the study of long-term time series, and are available in some large libraries. All of the census data published since 1967 are still available for sale on microfiche from the Census Bureau.

## AVAILABILITY OF MORE FREQUENT ECONOMIC DATA

While the censuses provide complete enumerations every 5 years, there are many needs for more frequent data as well. The Census Bureau conducts a number of monthly, quarterly, and annual surveys, the results of which appear in publication series such as *Current Business Reports* (retail and wholesale trade and service industries), the *Annual Survey of Manufactures*, *Current Industrial Reports*, and the *Quarterly Financial Report*. Most of these surveys, while providing more frequent

observations, yield less kind-of-business and geographic detail than the censuses. The *County Business Patterns* program offers annual statistics on the number of establishments, employment, and payroll classified by industry within each county.

## SOURCES FOR MORE INFORMATION

More information about the scope, coverage, classification system, data items, and publications for each of the economic censuses and related surveys is published in the *Guide to the 1987 Economic Censuses and Related Statistics*. More information on the methodology, procedures, and history of the censuses will be published in the *History of the 1987 Economic Censuses*. Contact Customer Services for information on availability.

## CENSUS OF MANUFACTURES

### General

This report, from the 1987 Census of Manufactures, is 1 of a series of 51 reports for each State and the District of Columbia. Each report contains such statistics as number of establishments, employment, payroll, value added by manufacture, cost of materials consumed, and capital expenditures for each State and its important metropolitan areas, counties, and places, by industry groups and individual industries. Selected statistical totals for "all manufacturing" have been shown for metropolitan areas with 250 employees or more and for counties and places with 450 employees or more.

Additional separate reports have been issued for 83 industry reports, each of which provides statistics for individual industries or groups of related industries and for subjects such as type of organization, distribution of sales by class of customer, and concentration ratios.

The *General Summary* report will contain industry, product class, and geographic area statistics summarized in one report. The introduction to the *General Summary* discusses, at greater length, many of the subjects described in this introduction. For example, the *General Summary* text will discuss the relationship of value added by manufacture to National income by industry of origin, the changes in statistical concepts over the history of the censuses, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

### Scope of Census and Definition of Manufacturing

The 1987 Census of Manufactures covers all establishments with one paid employee or more primarily engaged in manufacturing as defined in the *1987 Standard Industrial*

*Classification (SIC) Manual*<sup>1</sup>. This is the system of industrial classification developed by experts on classification in Government and private industry under the guidance of the Office of Information and Regulatory Affairs, Office of Management and Budget. This classification system is used by Government agencies as well as many organizations outside the Government.

The SIC Manual defines manufacturing as the mechanical or chemical transformation of substances or materials into new products. The assembly of component parts of products also is considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills that characteristically use power-driven machines and materials-handling equipment.

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salespersons. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

## **Relationship Between Annual Survey of Manufactures and Census of Manufactures**

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is a probability-based sample of approximately 56,000 establishments and collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, costs of purchased services, and foreign content of materials consumed. Except for supplemental labor costs, the extra ASM items are collected only in census years.

## **Establishment Basis of Reporting**

The census of manufactures is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location. The ASM also is conducted on an establishment basis, but separate reports are filed for just those establishments selected in the sample. Companies engaged in

distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1987, as in earlier years, a minimum size limit was set for inclusion of establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than \$5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units that serve manufacturing establishments of the same company (see Auxiliaries).

## **Manufacturing Universe and Census Report Forms**

The 1987 Census of Manufactures universe includes approximately 350,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in the publication are described below:

### **1. Small Single-Establishment Companies Not Sent a Report Form**

In the 1987 Census of Manufactures, approximately 150,000 small single-establishment companies were excused from filing reports. Selection of these small establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative records of Federal agencies. The cutoffs were selected so that these administrative-records cases would account for no more than 3 percent of the value of shipments for all manufacturing. Generally, all single-establishment companies with less than five employees were excused, while all establishments with more than 20 employees were mailed forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of other Federal agencies under special arrangements, which safeguarded their confidentiality. Estimates of data for these small establishments were developed using industry averages in conjunction with the administrative information. The value of shipments and cost of materials

<sup>1</sup>Standard Industrial Classification Manual: 1987: For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, Stock No. 041-001-00314-2.



were not distributed among specific products and materials for these establishments but were included in the product and material "not specified by kind" (n.s.k.) categories.

The industry classification codes included in the administrative-records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded at the four-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes these administrative-record cases were only given a two- or three-digit SIC group. For the 1987 Census of Manufactures, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the four-digit SIC level. Establishments that did not return the classification form were coded later to those four-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given two- or three-digit industry groups.

As a result of these situations, a number of small establishments may have been misclassified by industry. However, such possible misclassification has no significant effect on the statistics other than on the number of companies and establishments.

The total establishment count for individual industries should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

## 2. Establishments Sent a Report Form

The 200,000 establishments covered in the mail canvass were divided into three groups:

- a. **ASM sample establishments**—This group consisted of approximately 56,000 establishments covering all the units of large manufacturing establishments as well as a sample of the medium and smaller establishments. The probability of selection was proportionate to size (see appendix, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll, and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. See appendix A, section 2, for an explanation of these items.

The census part of the report form is one of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of these many forms to canvass the 459 manufacturing industries. Each form was developed for a group of related industries.

Appearing on each form was a list of products primary to the group of related industries as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and, in a large number of cases, the quantity of the product shipped during the survey year. Space also was provided for the respondent to describe products not specifically identified on the form.

The report form also contained a materials-consumed inquiry, which varied from form to form depending on the industries being canvassed. The respondents were asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and, in certain cases, the quantity consumed. Once again, space was provided for the respondent to describe significant material not identified on the form.

Finally, a wide variety of special inquiries was included to measure activities peculiar to a given industry, such as operations performed and equipment used.

- b. **Large and medium establishments (non-ASM)**—

Approximately 84,000 establishments were included in this group. A variable cutoff, based on administrative-records payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive one of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form. The product, material, and special inquiry sections supplied were based on the historical industry classification of the establishment.

- c. **Small single-establishment companies (non-ASM)**—

This group consisted of approximately 60,000 establishments. For those industries where application of the variable cutoff for administrative-records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received one of the approximately 80 versions of the short form, which requested

summary product and material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures.

Use of the short form has no adverse effect on published totals for the industry statistics; the same data were collected on the short form as on the long form. However, detailed information on materials consumed was not collected on the short form; thus its use would increase the value of the n.s.k. categories.

## Auxiliaries

Auxiliaries are establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. They can be at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two establishments or more. Where auxiliary operations are conducted at the same location as the manufacturing operation and operate as an integral part thereof, they usually are included in the report for the operating manufacturing establishment.

Included in the broad category of auxiliaries are administrative offices. Employees in administrative offices are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include (1) program planning, including sales research and coordination of purchasing, production, and distribution; (2) company purchasing, including general contracts and purchasing methods; (3) company financial policy and accounting; (4) general engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations; (5) direction of company personnel matters; and (6) legal and patent matters.

Other types of auxiliaries serving the plants or central management of the company include purchasing offices, sales promotion offices, research and development organizations, etc.

In the 1987 census, as in previous censuses, respondents were asked to file separate report forms (ES-9200) for auxiliary units which were at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two establishments or more.

This report includes information for separately operated auxiliaries tabulated from form ES-9200. Data for these establishments are included at the total manufacturing level in each table of this report and are shown separately in tables 5 through 9. Also included in this report are data for those auxiliary operations that are conducted at the same location as the manufacturing operation and are

collected as an integral part of the census of manufactures report form for the operating manufacturing establishment. These data are not shown separately in the tables.

A separate report on all separately operated auxiliaries, including those serving nonmanufacturing establishments, will be issued as part of the Enterprise Statistics program of the 1987 Economic Censuses. This report will provide data by industry of the establishment served, by primary activity of the parent company, by size of auxiliary, and by size of the parent company. Data will be presented on employment by type of activity performed by the employees and primary activity of the auxiliary. Information also will be shown on capital expenditures, inventories, and cost of research and development.

## Industry Classification of Establishments

Each of the establishments covered in the census was classified in 1 of 459 manufacturing industries in accordance with the industry definitions in the 1987 SIC Manual. The 1987 edition of this manual represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. Appendix A of the 1987 Manual notes the revisions in the four-digit industry levels between 1972/77 and 1987.

An industry is generally defined as a group of establishments producing the same product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of establishments must be significant in terms of number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions progressively become narrower with successive additions of numerical digits. For 1987, there are 20 major groups (two-digit SIC), 139 industry groups (three-digit SIC), and 459 industries (four-digit SIC). This represents an expansion of four-digit industries from 452 in 1972/77 and a reduction of three-digit groups from 143 in 1972/77. Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 11,000 products identified by a seven-digit code. The seven-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds, in value, production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is not only determined by the products it makes but also by the process employed in operations. Refining of nonferrous metals from ore or rolling and drawing of nonferrous metals (processes which involve heavy capitalization in specialized equipment) would be classified according to

the process used during a census year. These establishments then would be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified by industry only if the change in the primary activity from the prior year is significant or the change has occurred for 2 successive years. This procedure prevents reclassification when there are minor shifts in product mix.

In ASM years, establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see appendix, Annual Survey of Manufactures). However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The result of these rules covering the switching of plants from one industry classification to another is that, at the aggregate level, some industries comprise different mixes of establishments between survey years, and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the four-digit SIC level, should be viewed with caution. This is particularly true for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

As previously noted, the small establishments that may have been misclassified by industry are usually administrative-record cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of companies and establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establishments of an industry rarely specialize to this extent. The industry statistics (employment, inventories, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.), therefore, reflect not only the primary activities of the establishments in that industry but also their secondary activities.

The extent to which industry and product statistics may be matched with each other is measured by two ratios which are computed from the figures shown in table 5b. The first of these ratios, called the primary product specialization ratio, measures the proportion of product shipments (both primary and secondary) of the establishments classified in the industry represented by the primary products of those establishments. The second ratio, called the coverage ratio, is the proportion of primary products shipped by the establishments classified in the industry to total shipments of such products by all manufacturing establishments.

However, establishments making products falling into the same industry category may use a variety of processes and materials to produce them. Also, the same industry classification (based on end products) may include both establishments that are highly integrated and those that put only the finishing touches on an already highly fabricated item. For example, the refrigeration equipment industry includes instances of almost complete integration (production of the compressor, condensing unit, electric motor, casting, stamping of the case, and final assembly) all carried on at one plant. On the other hand, the condensing unit, the motor, and the case may be purchased and only assembled into the finished product.

In some instances, separate industry categories have been established for integrated and nonintegrated establishments. For other industries, the census provides separate statistics on the production of intermediate commodities made and used in the producing plant. For some industries characterized by many plants of the same company, separate figures on interplant transfers of products usually are shown.

Differences in the integration of production processes, types of operations, and alternatives in types of materials used should be considered when relating the industry statistics (employment, payrolls, value added, etc.) to the product and material data.

## GEOGRAPHIC AREA CODING

Accurate and complete information on the physical location of each establishment is required to tabulate the census data for States, metropolitan areas (MA's), counties, and incorporated municipalities including cities, towns, villages, boroughs, and townships.

A computerized system was developed which assigned an area code number and a prefix symbol to the mailing address before the questionnaires were mailed. The assignment of tentative code numbers by the computer was based on extensive reference files which have been continually updated and expanded. The prefix symbol indicated whether the information contained in the mailing address was sufficient to provide a clearly acceptable area code or whether there was some question about the physical location of the establishment. An example of this situation is when the mailing address is a P.O. box or a central office. Respondents were required to report their physical location (street address, municipality, county, and State) if it differed from their mailing address.

Whenever the respondent reported a physical location different from the mailing address, the corrected address was used to assign a geographic code to the establishment. In addition, if the prefix symbol indicated any question about the acceptability of the mailing address, the information received from the respondent on the actual location was later carefully reviewed. As in previous censuses, the mailing address of the establishment was not



always accepted as defining the physical location. For nonmail establishments (and those single-establishment companies that did not provide acceptable information on physical location), location information from the Internal Revenue Service tax forms was used as a basis for coding.

## GEOGRAPHIC AREAS COVERED

**The State**—Total data for each State and District of Columbia are published in tables 1 through 4. Table 5 presents data by State for two-, three-, and four-digit SIC industries with 150 manufacturing employees or more, except those whose inclusion would disclose data for individual companies.

**Metropolitan Statistical Areas (MSA's)**—An MSA is an integrated economic and social unit with a large population nucleus. Each MSA consists of one or more counties or statistically equivalent areas meeting published standards of population and metropolitan character; in the six New England States (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont), cities and towns (rather than counties) are used as the component geographic units.

An MSA with a population of 1 million or more may be subdivided into primary metropolitan statistical areas (PMSA's). A PMSA consists of a large urbanized county or a cluster of counties (cities and towns in New England) that demonstrate very strong internal economic and social links separate from the ties to other portions of its MSA.

Where PMSA's are defined, the MSA of which they are component parts is redesignated a consolidated metropolitan statistical area (CMSA).

Table 4 shows all manufacturing totals for MSA's, CMSA's, and PMSA's. Table 6 includes industry detail at two-, three-, and four-digit SIC level for MSA's, CMSA's, and PMSA's with 250 manufacturing employees or more, except those whose inclusion would disclose the data for individual companies.

**Industrial counties or county equivalents**—Counties are the primary divisions of States, except in Louisiana where they are called parishes and in Alaska where they are called boroughs and census areas. Georgia, Maryland, Missouri, Nevada, and Virginia have one place or more that is independent of any county organization and constitutes primary divisions of their States. These places are treated as counties. Table 4 represents total data for counties. Table 7 presents data by county for two-, three-, and four-digit industries with 450 manufacturing employees or more, except data whose inclusion would disclose data for individual companies.

**Places with 450 manufacturing employees or more**—The term "places" includes boroughs, towns, and villages, except boroughs in Alaska and New York. For

census purposes, places are defined as incorporated municipalities with populations of at least 2,500, or unincorporated municipalities with populations of at least 25,000, based on the 1980 population census. In addition, a few "industrial park" areas of substantial manufacturing activity but with population below the specified limits have been included in the 1987 Census of manufactures. Table 4 presents total data for places with 450 manufacturing employees or more. Table 8 presents data by places for two-, three-, and four-digit industries with 450 manufacturing employees or more, except those whose inclusions would disclose data for individual companies.

## CENSUS DISCLOSURE RULES

In accordance with Federal law governing census reports, no data are published that would disclose the data for an individual establishment or company. However, the number of establishments classified in a specific industry is not considered a disclosure, so this information may be released even though other information is withheld.

The disclosure analysis for the industry statistics in tables 4 through 8 of this report is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing information for individual companies, the complete line is suppressed. However, the suppressed data are included in higher-level totals. Additional disclosure analysis is performed for new capital expenditures that can be suppressed even though value of shipments data are publishable.

## SPECIAL TABULATIONS

Special tabulations of data collected in the 1987 Census of Manufactures may be obtained on computer tape or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

## ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this publication:

-	Represents zero.
(D)	Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
(IC)	Independent city
(NA)	Not available.
(NC)	Not comparable.
(S)	Withheld because estimate did not meet publication standards.

(X)	Not applicable.
(Z)	Less than half the unit shown.
CMSA	Consolidated metropolitan statistical area.
do	Ditto.
MSA	Metropolitan statistical area.
n.e.c.	Not elsewhere classified.
n.s.k.	Not specified by kind.
PMSA	Primary metropolitan statistical area.
pt.	Part.
r	Revised.
SIC	Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

## CONTACTS FOR DATA USERS

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Import/Export Publications	Foreign Trade Division	(301) 763-5140
Industry Analysis and Forecasts	International Trade Administration	(202) 377-4356



# Users' Guide for Locating Statistics in This Report by Table Number

[For definitions of metropolitan areas and explanation of terms, see appendixes]

Item	State statistics				Metropolitan area statistics				County statistics		Statistics for selected places	
	Historical	Operating ratios	All manufacturing totals	By selected industry	Historical (selected areas)	Operating ratios (selected areas)	All manufacturing totals	By selected industry	All manufacturing totals	By selected industry	All manufacturing totals	By selected industry
Number of establishments:												
Total.....	2a		*3, 4	5	2a		4	6	4	7	4	8
By employment-size class.....				9						9		
Number of companies .....			3									
Employment and payroll:												
Number of employees ....	1, 2a	2b	3, 4	5	2a	2b	4	6	4	7	4	8
Payroll .....	1, 2a	2b	3, 4	5	2a	2b	4	6	4	7	4	8
Supplemental labor costs ..			*3									
Production workers.....	2a	2b	*3, 4	5	2a	2b	4	6	4	7	4	8
Production-worker hours ..	2a	2b	*3, 4	5	2a	2b	4	6	4	7	4	8
Production-worker wages..	2a	2b	3, 4	5	2a	2b	4	6	4	7	4	8
Shipments, cost of materials, and value added:												
Value of shipments.....	2a	2b	3, 4	5	2a	2b	4	6	4	7	4	8
Value added by manufacture.....	2a	2b	3, 4	5	2a	2b	4	6	4	7	4	8
Cost of materials.....	2a	2b	*3, 4	5	2a	2b	4	6	4	7	4	8
Cost of fuels and electric energy .....			3									
Quantity of electric energy.....			*3									
Inventories:												
Beginning and end of year.....			*3									
Stage of fabrication.....			*3									
Expenditures, assets, rents, and purchased services:												
New capital expenditures.....	2a		*3, 4	5	2a		4	6	4	7	4	8
Used plant and equipment expenditures.....			*3									
Gross assets .....			*3									
Depreciation .....			*3									
Retirements of buildings and machinery .....			*3									
Rental payments .....			*3									

\*Detailed information shown.



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-- Not applicable for this report.

## SUMMARY OF FINDINGS

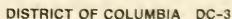
In 1987, 17.0 thousand persons were employed in the District of Columbia's manufacturing establishments. This figure represented an increase of 2 percent from the 1982 figure of 16.7 thousand workers.

The total value added by manufacture for the District of Columbia amounted to \$1.5 billion in 1987. This figure, along with all dollar figures in this report, are at prices current for the year specified, and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

In the District of Columbia, the leading industry groups ranked by employment were printing and publishing, food

and kindred products, and chemical and allied products. These same industry groups were the leaders in 1982.

The methods of data collection and use of administrative-record data are discussed in detail in the introduction. Single-establishment companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received in time to be tabulated) were obtained from administrative records of other agencies or developed from industry averages. For the District of Columbia, these establishments accounted for 16 percent of the total value of shipments.

**DISTRICT OF COLUMBIA - Metropolitan Statistical Area,  
Counties, Independent Cities, and Other Selected Places**



**Table 1. Historical Employment Statistics for Operating Manufacturing Establishments and Auxiliaries for the District and the Washington, DC-MD-VA Metropolitan Statistical Area: 1987 and Earlier Census Years**

[For definitions of CMSA's, MSA's, and PMSA's, information on geographic areas followed by ▲, and general geographic information, see appendixes. For meaning of abbreviations and symbols, see introductory text]

Geographic area and year	All establishments		Operating manufacturing establishments		Auxiliaries <sup>1</sup>	
	Employees (1,000)	Payroll (million dollars)	Employees (1,000)	Payroll (million dollars)	Employees (1,000)	Payroll (million dollars)
<b>DISTRICT OF COLUMBIA</b>						
1987 Census .....	17.0	494.1	15.7	430.0	1.3	64.1
1982 Census .....	16.7	393.7	15.1	337.1	1.6	56.6
1977 Census .....	18.6	297.6	17.5	268.1	1.1	29.5
1972 Census .....	19.4	220.0	18.4	203.2	1.0	16.8
<b>METROPOLITAN STATISTICAL AREAS</b>						
<b>Washington, DC-MD-VA MSA</b>						
1987 Census .....	103.2	2 992.4	92.4	2 517.5	10.8	474.9

<sup>1</sup>Defined in introductory text. Data for these establishments are included at the total manufacturing level in each table in this report. Data for these establishments are shown separately in tables 5 through 9.

**Table 2a. Historical Statistics for the District and the Washington, DC-MD-VA Metropolitan Statistical Area: 1987 and Earlier Census Years**

[Includes operating manufacturing establishments and auxiliaries. Includes MSA's with 40,000 manufacturing employees or more. For definitions of CMSA's, MSA's, and PMSA's, information on geographic areas followed by ▲, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

Year <sup>1</sup>	All establishments <sup>2</sup>		All employees		Production workers			Value added by manufac- tures (million dollars)	Cost of materials <sup>4</sup> (million dollars)	Value of ship- ments (million dollars)	New capital expendi- tures (million dollars)	Comparative indexes and U.S. employment			
	Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					Percent of U.S. manufac- turing employ- ment	Index of State/ MSA employ- ment (1977 = 100)	Index of U.S. manu- factur- ing employ- ment (1977 = 100)	U.S. manu- factur- ing employ- ment (1,000)
DISTRICT OF COLUMBIA															
1987 Census ..	486	124	17.0	494.1	5.2	10.7	118.8	1 525.4	615.0	2 128.3	43.6	.09	91	97	18 933.6
1982 Census ..	518	127	16.7	393.7	6.4	12.0	125.3	928.6	608.4	1 537.1	55.1	.09	90	98	19 137.2
1977 Census ..	555	130	18.6	297.6	7.5	13.3	102.3	610.2	377.7	984.4	18.1	.10	100	100	19 596.9
1972 Census ..	564	135	19.4	220.0	7.5	16.5	96.7	389.0	250.7	630.9	18.9	.10	104	98	19 028.7
Washington, DC-MD-VA MSA															
1987 Census ..	2 744	767	103.2	2 992.4	44.2	88.3	957.9	6 788.0	4 193.5	10 859.3	352.0	.54	(NA)	97	18 933.6

<sup>1</sup>For intercensal data for the years between 1963 and 1978, see the 1978-1979 Annual Survey of Manufactures (ASM) clothbound volume. For intercensal State data for the years 1983 through 1986, see 1986 Annual Survey of Manufactures, Geographic Area Statistics, (M86(AS)-3) table 1. For data prior to 1963, see the 1963 Census of Manufactures, vol. III, table 2 of the State chapter.

<sup>2</sup>Includes establishments with payroll at any time during year.

<sup>3</sup>Value added by manufacturing for 1982 is computed using inventory data reported at cost or market prior to any adjustment to LIFO cost. This uniform instruction is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, 1967 and 1982 data for value added by manufacturing are not comparable to prior-year data. For further explanation, see inventories in appendixes.

<sup>4</sup>Aggregate of cost of materials and value of shipments includes extensive duplication since products of some industries are used as materials by others.

**Table 2b. Selected Operating Ratios for the District and the Washington, DC-MD-VA Metropolitan Statistical Area: 1987 and Earlier Census Years**

[Includes operating manufacturing establishments and auxiliaries. Includes MSA's with 40,000 manufacturing employees or more. For definitions of CMSA's, MSA's, and PMSA's, information on geographic areas followed by A, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

Geographic area and year	Payroll per employee (dollars)	Production worker as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production-worker hour (dollars)
<b>DISTRICT OF COLUMBIA</b>									
1987 Census .....	29 065	31	2 060	110.4	29	52	89 729	32	142.57
1982 Census .....	23 575	38	1 875	104.8	39	65	55 805	42	77.38
1977 Census .....	16 000	40	1 773	76.9	38	69	32 806	49	45.88
1972 Census .....	11 340	48	1 755	58.6	40	75	20 052	57	23.58
<b>METROPOLITAN STATISTICAL AREAS</b>									
<b>Washington, DC-MD-VA MSA</b>									
1987 Census .....	28 996	43	1 996	108.4	39	66	65 775	44	76.87

Note: For qualifications of data, see footnotes in table 2a.

**Table 3. Summary Statistics for the District: 1987**

[Includes operating manufacturing establishments and auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	1987	Item	1987
Companies <sup>1</sup> .....	455	Inventories by stage of fabrication:	
All establishments <sup>2</sup> .....	486	Beginning of year .....	100.7
With 1 to 19 employees .....	392	Finished goods .....	37.0
With 20 to 99 employees .....	105	Work-in-process .....	26.8
With 100 employees or more .....	19	Materials and supplies .....	36.9
Employment and labor costs:		End of year .....	111.7
Employees .....	1,000	Finished goods .....	41.0
Compensation, total .....	581.1	Work-in-process .....	34.9
Annual payroll .....	494.1	Materials and supplies .....	35.8
Fringe benefits .....	87.0	Gross book value of depreciable assets:	
Social Security and other legally required payments .....	34.7	Total:	
Employer payments and other programs .....	52.4	Beginning of year .....	508.2
Production workers:		New capital expenditures .....	43.6
Average for year .....	1,000	Used capital expenditures .....	1.6
March .....	5.2	Retirements .....	54.6
May .....	5.2	End of year .....	498.7
August .....	5.2	Buildings and other structures:	
November .....	5.2	Beginning of year .....	222.7
Hours .....	10.7	New capital expenditures .....	17.9
January to March .....	2.7	Used capital expenditures .....	8
April to June .....	2.7	Retirements .....	41.9
July to September .....	2.7	End of year .....	199.5
October to December .....	2.7	Machinery and equipment:	
Wages .....	118.8	Beginning of year .....	285.5
Value added by manufacture .....	1 525.4	New capital expenditures .....	25.7
Cost of materials <sup>3</sup> .....	615.0	Used capital expenditures .....	8
Materials, parts, containers, etc., consumed .....	384.1	Retirements .....	12.7
Retailers .....	22.2	End of year .....	299.2
Fuels .....	3.0	Depreciation charges during 1987:	
Purchased electricity .....	8.5	Total .....	36.1
Contract work .....	197.1	Buildings and other structures .....	5.8
Quantity of electric energy used for heat and power:		Machinery and equipment .....	30.3
Purchased .....	127.4	Rental payments:	
Generated less sold .....	-	Total .....	23.0
Value of shipments <sup>3</sup> .....	2 128.3	Buildings and other structures .....	18.0
		Machinery and equipment .....	7.0

<sup>1</sup>For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

<sup>2</sup>Includes establishments with payroll at any time during year.

<sup>3</sup>Aggregate of cost of materials and value of shipments includes extensive duplication, since products of some industries are used as materials by others (see appendixes).



**Table 4. Statistics for the District and the Washington, DC-MD-VA Metropolitan Statistical Area: 1987**

[Includes operating manufacturing establishments and auxiliaries. Includes places with 450 manufacturing employees or more. For definitions of CMSA's, MSA's, and PMSA's, information on geographic areas followed by A, and explanation of terms, see appendices. For meaning of abbreviations and symbols, see introductory text]

Geographic area	E <sup>1</sup>	All establishments <sup>2</sup>		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials <sup>3</sup> (million dollars)	Value of shipments <sup>3</sup> (million dollars)	New capital expenditures <sup>3</sup> (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil-ions)	Wages (million dollars)				
District of Columbia .....	E1	486	124	17.0	494.1	5.2	10.7	118.8	1 525.4	615.0	2 128.3	43.6
<b>METROPOLITAN STATISTICAL AREAS</b>												
Washington, DC-MD-VA MSA .....	E1	2 744	767	103.2	2 992.4	44.2	88.3	957.9	6 788.0	4 193.5	10 859.3	352.0
Portion in District of Columbia .....	E1	486	124	17.0	494.1	5.2	10.7	118.8	1 525.4	615.0	2 128.3	43.6
Portion in Maryland .....	E1	1 223	358	44.1	1 162.7	22.7	45.4	464.1	2 377.3	2 044.3	4 435.6	152.4
Portion in Virginia .....	E1	1 035	285	42.1	1 335.6	16.3	32.3	375.0	2 885.2	1 534.2	4 295.4	156.0

<sup>1</sup>Payroll, employment, and sales data for some small single unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for other establishments whose reports were not received at time data were tabulated. The following symbols are shown where estimated data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

<sup>2</sup>Includes establishments with payroll at any time during year.

<sup>3</sup>Aggregate of cost of materials and value of shipments includes extensive duplication, since products of some industries are used as materials by others (see appendices).

**Table 5. Statistics by Selected Industry Group and Industry for the District: 1987 and 1982**

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendices]

SIC code	Industry	1987											1982	
		All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees (1,000)	Value added by manufacture (million dollars)
		E	Total (no.)	With 20 employees or more (no.)	Number <sup>1</sup> (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil-ions)						
	All industries .....	E1	486	124	17.0	494.1	5.2	10.7	118.8	1 525.4	615.0	2 128.3	43.6	16.7
20	Food and kindred products .....	-	16	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.2	58.4
205	Bakery products .....	-	9	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
2051	Bread, cake, and related products .....	-	8	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
27	Printing and publishing .....	E1	302	75	13.4	374.3	3.6	7.6	86.8	1 379.3	492.2	1 860.4	37.7	11.7
271	Newspapers .....	-	28	8	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
2711	Newspapers .....	-	28	8	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
272	Periodicals .....	-	73	25	5.0	154.7	.5	.8	9.2	563.6	297.4	850.4	21.3	3.2
2721	Periodicals .....	-	73	25	5.0	154.7	.5	.8	9.2	563.6	297.4	850.4	21.3	3.2
273	Books .....	E9	19	2	.2	4.3	.1	.7	1.5	13.0	6.3	19.2	.4	BB
274	Miscellaneous publishing .....	E3	30	7	.4	12.8	.1	.2	1.4	36.3	15.3	51.6	.7	.9
2741	Miscellaneous publishing .....	E3	30	7	.4	12.8	.1	.2	1.4	36.3	15.3	51.6	.7	.9
275	Commercial printing .....	E5	116	22	1.9	51.8	1.4	2.8	34.8	89.8	101.1	190.6	3.6	(NA)
2752	Commercial printing, lithographic .....	E2	84	16	1.2	34.2	.9	1.9	21.1	59.2	44.4	103.3	2.7	1.8
2759	Commercial printing, n.e.c. ....	E8	32	6	.6	17.6	.5	.9	13.7	30.6	56.7	87.3	1.0	(NA)
279	Printing trade services .....	-	30	8	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
2791	Typesetting .....	E2	24	6	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
2798	Platemaking services .....	-	6	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
28	Chemicals and allied products .....	E2	6	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
289	Miscellaneous chemical products .....	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
2893	Printing ink .....	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
32	Stone, clay, and glass products .....	E1	8	3	.2	5.4	.2	.4	3.7	15.0	19.7	34.6	(D)	(NA)
327	Concrete, gypsum, and plaster products .....	E1	6	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3273	Ready-mixed concrete .....	E1	6	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
34	Fabricated metal products .....	E7	13	5	.3	6.9	.2	.4	4.2	14.5	11.9	26.6	.3	(NA)
344	Fabricated structural metal products .....	E8	8	4	.2	6.3	.2	.3	3.8	13.0	10.8	24.0	.3	(NA)
35	Industrial machinery and equipment .....	E7	5	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	5.3
38	Electronic and other electric equipment .....	E4	8	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)

See footnotes at end of table.

**Table 5. Statistics by Selected Industry Group and Industry for the District: 1987 and 1982—Con.**

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Text: For explanation of terms, see Appendix

SIC code	Industry		1987											1982		
			All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees (1,000)	Value added by manufacture (million dollars)	
			Total (no.)	With 20 employees or more (no.)	Number <sup>1</sup> (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)							
E																
39	Miscellaneous manufacturing industries	E1	16	5	.3	4.8	.2	.3	2.2	6.2	4.8	11.1	.3	.2	4.8	
399	Miscellaneous manufactures	-	8	4	.2	4.0	.1	.2	1.8	4.7	3.3	8.0	.2	(NA)	(NA)	
3993	Signs and advertising specialties	-	7	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
-	Auxiliaries	-	79	20	1.3	64.1	-	-	-	-	-	-	-	(NA)	(NA)	

Note: For qualifications of data, see footnotes in table 4.

<sup>1</sup>Statistics for some levels are withheld to avoid disclosing data for individual companies. However, for such disclosures with 150 employees or more, number of establishments is shown and employment-size is indicated by one of the following symbols: AA-150 to 249 employees; BB-250 to 499 employees; CC-500 to 999 employees; EE-1,000 to 2,499 employees; FF-2,500 or more. Statistics for industry groups shown include data for all component industries, regardless of whether data are shown for individual industries in group.

**Table 6. Statistics by Selected Industry Group and Industry for the Washington, DC-MD-VA Metropolitan Statistical Area: 1987**

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 250 employees or more within MSA's, except those that would disclose data for individual companies. For definitions of CMSA's, MSA's, and PMSA's, information on geographic areas followed by A, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

SIC code													
SIC code	Geographic area and industry	All establishments			All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
		E	Total (no.)	With 20 employees or more (no.)	Number <sup>1</sup> (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
	Washington, DC-MD-VA MSA	E1	2 744	767	103.2	2 992.4	44.2	88.3	957.9	6 788.0	4 193.5	10 859.3	352.0
20	Food and kindred products	-	92	37	4.6	116.6	2.7	5.4	60.8	476.1	749.6	1 224.2	23.9
201	Meat products	E2	9	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2013	Sausages and other prepared meats	E1	7	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
202	Dairy products	-	14	9	1.1	34.2	.5	1.2	16.9	103.5	295.7	398.1	9.9
2026	Fluid milk	-	7	7	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
205	Bakery products	-	36	13	1.8	42.7	1.1	2.2	26.4	156.5	103.2	259.6	6.2
2051	Bread, cake, and related products	-	34	13	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
208	Beverages	-	8	5	.9	22.6	.3	.8	7.3	152.9	189.5	342.6	4.2
2086	Bottled and canned soft drinks	-	5	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
23	Apparel and other textile products	E3	70	15	1.6	22.4	1.4	2.3	17.1	50.1	35.3	85.8	1.3
231	Men's and boys' suits and coats	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2311	Men's and boys' suits and coats	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
233	Women's and misses' outerwear	E6	16	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2335	Women's, misses', and juniors' dresses	E9	8	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
239	Miscellaneous fabricated textile products	E4	47	8	.4	6.3	.3	.5	3.6	13.5	18.3	32.1	.6
24	Lumber and wood products	E2	111	19	1.9	38.4	1.5	3.0	25.3	72.7	111.5	184.0	3.3
243	Millwork, plywood, and structural members	E2	57	10	1.0	21.3	.7	1.5	13.7	41.7	41.4	83.0	1.6
2431	Millwork	E2	24	4	.6	11.4	.4	.9	7.8	24.2	23.5	47.6	.5
2434	Wood kitchen cabinets	E3	27	4	.4	8.5	.2	.5	5.0	16.0	14.5	30.5	1.0
245	Wood buildings and mobile homes	-	9	4	.5	10.9	.4	.8	6.9	16.7	47.9	64.6	.8
2452	Prefabricated wood buildings	-	9	4	.5	10.9	.4	.8	6.9	16.7	47.9	64.6	.8
25	Furniture and fixtures	E5	95	14	1.4	26.6	1.1	2.1	16.1	51.5	43.9	98.8	1.8
251	Household furniture	E5	31	6	.6	8.9	.5	1.0	6.6	20.7	21.5	42.2	.3
2511	Wood household furniture	E7	26	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
254	Partitions and fixtures	E5	30	4	.3	7.5	.3	.5	5.0	13.6	9.3	23.1	.8
2541	Wood partitions and fixtures	E4	28	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
26	Paper and allied products	E4	14	5	.3	6.3	.2	.5	4.2	18.2	13.5	29.9	.4

See footnotes at end of table.

**Table 6. Statistics by Selected Industry Group and Industry for the Washington, DC-MD-VA Metropolitan Statistical Area: 1987-Con.**

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 250 employees or more within MSA's, except those that would disclose data for individual companies. For definitions of CMSA's, MSA's, and PMSA's, information on geographic areas followed by A, and explanation of terms, see appendices. For meaning of abbreviations and symbols, see introductory text]

SIC code	Geographic area and industry	All establishments		All employees		Production workers			Value added by manufacturing (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	
		E	Total (no.)	With 20 employees or more (no.)	Number <sup>1</sup> (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)					Wages (million dollars)
27	Washington, DC-MD-VA MSA-Con.												
271	Printing and publishing	E1	1 230	284	36.1	943.1	15.1	30.8	347.0	2 755.0	1 274.2	4 009.7	125.6
2711	Newspapers	-	110	34	10.3	241.3	2.0	4.0	41.5	992.4	206.8	1 199.1	39.2
272	Periodicals	E1	179	43	7.0	198.6	.8	1.3	14.5	693.8	352.2	1 035.2	25.0
2721	Periodicals	E1	179	43	7.0	198.6	.8	1.3	14.5	693.8	352.2	1 035.2	25.0
273	Books	E2	81	19	2.1	53.9	1.2	2.8	21.6	199.7	90.8	285.7	8.8
2731	Book publishing	E1	64	5	.8	25.7	.1	.7	2.1	148.1	53.0	196.1	1.0
2732	Book printing	E3	17	14	1.3	28.2	1.1	2.1	19.6	51.6	37.8	89.6	7.8
274	Miscellaneous publishing	E4	75	24	2.2	56.6	.5	.9	9.5	143.7	53.6	197.1	2.5
2741	Miscellaneous publishing	E4	75	24	2.2	56.6	.5	.9	9.5	143.7	53.6	197.1	2.5
275	Commercial printing	E3	660	131	12.2	330.0	8.8	17.8	214.5	599.8	525.5	1 122.1	37.8
2752	Commercial printing, lithographic	E2	496	109	10.4	286.4	7.4	15.2	183.1	520.2	435.6	952.8	34.6
2759	Commercial printing, n.e.c.	E6	158	20	1.7	41.7	1.3	2.5	30.0	76.2	87.2	163.4	2.7
276	Manifold business forms	-	5	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2761	Manifold business forms	-	5	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
278	Blankbooks and bookbinding	-	15	7	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2781	Bookbinding and related work	-	14	7	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
279	Printing trade services	E1	104	23	1.5	42.4	1.2	2.5	31.9	68.7	20.3	89.0	6.4
2791	Typesetting	E3	93	19	1.1	25.6	.9	1.8	17.9	43.9	8.1	51.9	1.5
2796	Platemaking services	-	11	4	.4	16.8	.3	.7	14.0	24.9	12.2	37.1	4.8
28	Chemicals and allied products	E1	44	17	1.6	47.9	.9	1.8	19.1	197.8	180.5	377.3	12.3
283	Drugs	E1	12	5	.8	23.2	.4	.7	7.4	40.4	27.6	68.0	3.3
2835	Diagnostic substances	-	4	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2836	Biological products, except diagnostic	E1	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
289	Miscellaneous chemical products	E2	12	5	.5	13.2	.2	.5	6.0	31.1	44.6	75.7	1.5
2893	Printing ink	-	3	.4	10.6	.2	.4	4.8	22.0	34.6	56.6	1.1	
29	Petroleum and coal products	-	8	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
295	Asphalt paving and roofing materials	-	7	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
30	Rubber and miscellaneous plastics products	E2	45	13	.8	17.2	.6	1.2	10.2	36.5	32.9	68.8	1.4
308	Miscellaneous plastics products, n.e.c.	E2	42	13	.8	17.1	.6	1.2	10.2	36.4	32.8	68.6	1.4
3089	Plastics products, n.e.c.	E3	30	9	.6	12.0	.4	.9	7.5	25.3	19.6	44.8	1.1
31	Leather and leather products	-	6	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
314	Footwear, except rubber	-	2	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3143	Men's footwear, except athletic	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
32	Stone, clay, and glass products	-	117	51	3.3	78.9	2.5	5.3	55.8	209.9	231.1	441.3	16.4
325	Structural clay products	-	6	4	.3	6.8	.3	.6	5.2	15.7	12.0	28.3	(D)
3251	Brick and structural clay tile	-	4	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
327	Concrete, gypsum, and plaster products	-	84	44	2.8	66.5	2.0	4.4	46.7	175.8	205.2	380.5	14.4
3271	Concrete block and brick	-	12	7	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3272	Concrete products, n.e.c.	E1	27	12	.7	12.7	.5	1.1	8.7	27.7	17.0	44.9	1.6
3273	Ready-mixed concrete	-	45	25	1.8	46.6	1.4	3.0	34.6	130.3	159.5	289.9	11.4
33	Primary metal industries	E1	16	6	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
333	Primary nonferrous metals	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3334	Primary aluminum	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
34	Fabricated metal products	E2	140	53	3.9	86.3	2.8	5.8	51.7	183.9	205.1	382.0	14.3
344	Fabricated structural metal products	E2	81	41	2.5	58.3	1.7	3.4	33.3	121.0	134.1	252.0	3.6
3441	Fabricated structural metal	E1	20	12	.7	17.7	.6	1.2	11.2	33.4	61.9	94.7	.7
3444	Sheet metal work	E2	24	11	.5	10.9	.4	.8	7.6	32.5	15.9	47.3	1.7
3446	Architectural metal work	E3	20	9	.5	12.1	.3	.7	6.9	20.2	15.9	37.8	.3
3449	Miscellaneous metal work	E6	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
348	Ordinance and accessories, n.e.c.	-	4	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
349	Miscellaneous fabricated metal products	-	17	6	.8	15.2	.6	1.3	11.3	35.3	37.5	71.4	(D)
3494	Valves and pipe fittings, n.e.c.	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35	Industrial machinery and equipment	E2	150	34	3.3	84.1	1.9	4.3	37.5	189.3	142.7	334.5	9.4
357	Computer and office equipment	E1	35	11	1.2	36.1	.5	.9	9.4	97.7	74.9	174.5	3.7
3571	Electronic computers	E3	17	3	.3	10.5	.2	.4	4.3	32.0	23.3	58.0	.7
3577	Computer peripheral equipment, n.e.c.	-	10	4	.5	13.9	.2	.4	3.4	43.1	34.4	77.5	1.6
358	Refrigeration and service machinery	-	9	4	.9	18.5	.6	1.7	10.6	34.7	37.4	72.4	(D)
3585	Refrigeration and heating equipment	-	5	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
359	Industrial machinery, n.e.c.	E3	78	11	.8	19.2	.6	1.2	13.4	33.4	12.8	46.1	2.5
3599	Industrial machinery, n.e.c.	E3	77	11	.8	19.2	.6	1.2	13.4	33.4	12.8	46.1	2.5

See footnotes at end of table.

**Table 6. Statistics by Selected Industry Group and Industry for the Washington, DC-MD-VA Metropolitan Statistical Area: 1987—Con.**

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 250 employees or more within MSA's, except those that would disclose data for individual companies. For definitions of CMSA's, MSA's, and PMSA's, information on geographic areas followed by A, and explanation of terms, see appendices. For meaning of abbreviations and symbols, see introductory text.]

SIC code	Geographic area and industry	E	All establishments		All employees		Production workers			Value added by manufacturing (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number <sup>1</sup> (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
36	<b>Washington, DC-MD-VA MSA—Con.</b>												
362	Electronic and other electric equipment .....	E2	170	76	11.0	311.4	4.9	9.8	99.9	558.9	371.1	944.0	26.7
3625	Electrical industrial apparatus .....	-	9	3	.6	11.2	.3	.8	4.7	21.4	13.9	34.9	(D)
3625	Relays and industrial controls .....	-	4	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
364	Electric lighting and wiring equipment .....	E4	10	4	.4	10.5	.2	.4	4.2	18.6	20.9	40.3	(D)
366	Communications equipment .....	E2	51	32	5.7	170.8	2.5	4.7	54.2	321.1	217.8	526.7	14.2
3661	Telephone and telegraph apparatus .....	E5	13	13	2.9	83.6	.8	1.7	16.1	142.6	109.7	248.9	5.1
3663	Radio and television communications equipment .....	-	20	15	2.5	79.3	1.5	2.8	35.0	159.3	101.0	251.4	8.6
3669	Communications equipment, n.e.c. ....	E3	18	4	.3	7.9	.2	.3	3.1	19.3	7.1	26.4	.5
367	Electronic components and accessories .....	E3	62	23	1.8	41.1	1.1	2.4	23.7	79.6	48.0	129.7	4.6
3672	Printed circuit boards .....	E1	11	7	.5	11.0	.4	.9	6.8	22.7	14.5	36.6	1.7
3673	Semiconductors and related devices .....	E2	10	4	.6	14.6	.3	.6	7.6	15.5	13.8	31.9	1.4
3679	Electronic components, n.e.c. ....	E4	38	12	.7	14.7	.5	.9	8.9	40.1	18.8	59.2	1.4
369	Miscellaneous electrical equipment and supplies .....	-	20	9	2.3	73.5	.6	1.1	10.8	107.5	60.0	191.4	2.9
3699	Electrical equipment and supplies, n.e.c. ....	-	13	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
37	<b>Transportation equipment</b> .....	-	29	10	4.7	176.3	2.2	4.0	67.7	423.2	176.6	600.0	24.9
376	Guided missiles, space vehicles, parts .....	-	5	5	4.3	170.4	1.8	3.4	63.2	412.2	161.9	574.2	(D)
3761	Guided missiles and space vehicles .....	-	1	1	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3764	Space propulsion units and parts .....	-	2	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3769	Space vehicle equipment, n.e.c. ....	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
38	<b>Instruments and related products</b> .....	-	133	51	14.5	487.9	4.1	7.8	95.4	1 319.5	408.1	1 617.0	80.4
381	Search and navigation equipment .....	-	24	14	10.3	369.8	1.9	3.6	43.7	1 101.6	274.7	1 272.4	65.3
3812	Search and navigation equipment .....	-	24	14	10.3	369.8	1.9	3.6	43.7	1 101.6	274.7	1 272.4	65.3
382	Measuring and controlling devices .....	E1	56	24	3.3	95.5	1.8	3.2	42.6	159.5	95.5	247.4	12.9
3825	Instruments to measure electricity .....	-	13	8	1.6	55.9	.9	1.5	26.6	72.8	43.4	111.2	7.3
3826	Analytical instruments .....	E2	14	3	.5	14.4	.2	.4	4.9	38.2	24.4	61.3	1.9
3829	Measuring and controlling devices, n.e.c. ....	-	11	6	.7	13.5	.4	.8	6.8	23.1	12.3	34.8	2.7
384	Medical instruments and supplies .....	E4	32	9	.5	10.9	.3	.6	5.0	34.1	20.5	55.2	1.0
3842	Surgical appliances and supplies .....	E3	11	6	.3	7.0	.2	.4	2.8	25.0	16.1	41.7	.4
386	Photographic equipment and supplies .....	E7	15	3	.4	11.3	.2	.3	4.0	23.6	17.2	40.9	1.2
3861	Photographic equipment and supplies .....	E7	15	3	.4	11.3	.2	.3	4.0	23.6	17.2	40.9	1.2
39	<b>Miscellaneous manufacturing industries</b> .....	E3	120	23	1.3	25.9	.9	1.6	15.1	46.3	28.7	75.2	1.9
399	Miscellaneous manufactures .....	E3	80	18	1.0	21.1	.6	1.2	12.3	35.0	20.4	56.0	1.3
3993	Signs and advertising specialties .....	E3	54	15	.8	18.2	.5	1.0	10.6	28.9	16.4	45.8	1.1
--	<b>Auxiliaries</b> .....	-	150	56	10.8	474.9	-	-	-	-	-	-	-

Note: For qualification of data, see footnotes in table 4.

<sup>1</sup>Statistics for some levels are withheld to avoid disclosing data for individual companies. However, for such disclosures with 150 employees or more, number of establishments is shown and employment-size range is indicated by one of the following symbols: AA-150 to 249 employees; BB-250 to 499 employees; CC-500 to 999 employees; EE-1,000 to 2,499 employees; FF-2,500 or more. Statistics for industry groups shown include data for all component industries, regardless of whether data are shown for individual industries in group.

**Table 7. Statistics by Selected Industry Group and Industry for Selected Counties: 1987**

[Not applicable]

**Table 8. Statistics by Selected Industry Group and Industry for Selected Places: 1987**

[Not applicable]







# APPENDIX A.

## Explanation of Terms

This appendix is in two sections. Section 1 includes items requested of all establishments mailed census of manufactures forms including annual survey of manufactures (ASM) forms. Note that this section also includes several items (number of establishments and companies, value added, classes of products, and specialization and coverage ratios) not included on the report forms but derived from information collected on the forms. Section 2 covers supplementary items requested only from establishments included in the ASM sample. Results of the supplementary ASM inquiries are included in table 3 of this report.

### SECTION 1. ITEMS COLLECTED OR DERIVED BASED ON ALL CENSUS OF MANUFACTURES (INCLUDING ASM) REPORT FORMS

**Number of establishments and companies**—As discussed in the Introduction, a separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operated at different physical locations, even if the individual locations were producing the same line of goods, a separate report was requested for each location. If the company operated in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on any employees, capital expenditures, inventories, or shipments from inventories during the year.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction of the General Summary subject report.

**Employment and related items**—The report forms requested separate information on production workers for a specific payroll period within each quarter of the year and on other employees as of the payroll period which included the 12th of March.

**All employees**—This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period which included the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods.

Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

**Production workers**—This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

**All other employees**—This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver salespersons), sales delivery (highway truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment engaged in the construction of major additions or alterations to the plant and utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls also was requested of auxiliary units (e.g., administrative offices, warehouses, and research and development laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual

industries shown in this report. They are included in the general summary and geographic area reports as a separate category.

**Payroll**—This item includes the gross earnings of all employees on the payroll of operating manufacturing establishments paid in the calendar year 1987. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of corporations; it excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payroll of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plans, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As in the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups, but are included in the data for the geographic area (State, MSA, county, place) as a whole.

**Production-worker hours**—This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave.

**Cost of materials**—This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by

others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

**Value of shipments**—This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

**Duplication in cost of materials and value of shipments**—The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication since the products of some industries are used as materials by others. This duplication results, in part, from the addition of related industries representing successive stages in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the food group and the addition of pulp mills to paper mills in the paper and allied products group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication (the value of finished manufactures) tends to approximate two-thirds of the total value of products reported in the annual survey.

Duplication of products within individual industries is significant within a number of industry groups, e.g., machinery and transportation industries. These industries frequently include complete machinery and their parts. In this case, the parts made for original equipment are materials consumed for assembly plants in the same industry.

Even when no significant amount of duplication is involved, value of shipments figures are deficient as measures of the relative economic importance of individual manufacturing industries or geographic areas because of the wide variation in ratio of materials, labor, and other processing costs of value of shipments, both among industries and within the same industry.

Before 1962, cost of materials and value of shipments were not published for some industries which included considerable duplication. Since then, these data have



been published for all industries at the United States level and beginning in 1964, for all geographic levels.

**Value added by manufacture**—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

"Value added" avoids the duplication in the figure for value of shipments that results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

**New and used capital expenditures**—For establishments in operation and any known plants under construction, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures include expenditures leased from nonmanufacturing concerns through capital leases. New facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations are excluded. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers also were requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred for the use of the reporting establishment by the parent company or one of its subsidiaries, the value at

which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in table 3b.

**End-of-year inventories**—Respondents were asked to report their 1986 and 1987 end-of-year inventories at cost or market. Effective with the 1982 Economic Censuses, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

Because of this change in reporting instructions, the 1982 through 1987 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this report and in historical census of manufactures and annual survey of manufactures publications.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing", which are aggregates of figures reported by establishments in specified industries.

## SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORMS

The following items were collected only from establishments included in the ASM sample:

1. **Supplemental labor costs**—Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not specifically required by legislation whether they

were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans. They exclude such items as company-operated cafeterias, in-plant medical services, free parking

lots, discounts on employee purchases, and uniforms and work clothing for employees. While the excluded items do benefit employees and all or part of their cost generally is similar to the items covered in the ASM labor costs statistics, accounting records generally do not provide reliable figures on net employee benefits of these types.

2. **Retirements of depreciable assets**—Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1987. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent also was requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.
3. **Depreciation charges for fixed assets**—This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.
4. **Rental payments**—Total rental payments is collected on all census forms. However, the breakdown between rental payments for buildings and other structures and rental payments for machinery and equipment is collected only on the ASM forms. This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.

When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets was to be reported as assets of the establishment at the end of the year.

If there were assets at an establishment rented from another company and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.

5. **Depreciable assets**—Total value of gross depreciable assets is collected on all census forms. However, the detail for depreciable assets is collected only on the ASM forms. The data encompass

all fixed depreciable assets on the books of establishments at the beginning and end of the year. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, machinery, and equipment (production, office, and transportation equipment) for which depreciation reserves are maintained. Excluded are nondepreciable capital assets, including inventories and intangible assets, such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equalled assets at the end of the year.

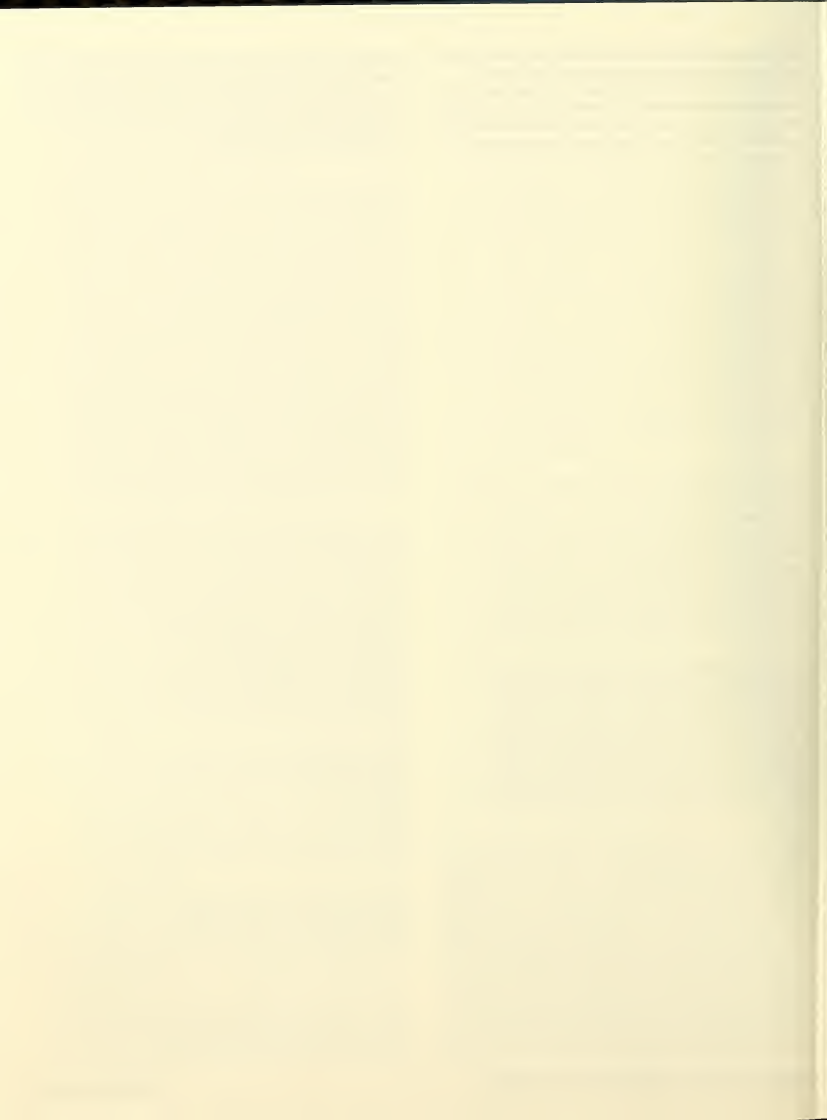
6. **New and used capital expenditures**—The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)
7. **Quantity of electric energy consumed for heat and power**—Data on the cost of purchased electric energy were collected on all census forms. However, data on the quantity of purchased electric energy were collected only on the ASM forms. In addition, information was collected on the quantity of electric energy generated by the establishment and the quantity of electric energy sold or transferred to other plants of the same company.

The same approach was utilized to produce these statistics. For items 1 through 6, data were estimated (imputed) for all non-ASM establishments using the available data in the establishment record and industry-based parameters. The statistics were then generated by simply tabulating all census records including the imputed value for non-ASM establishments and the unweighted value for ASM establishments. Separate imputation rates were developed and are shown in the table. For quantity of purchased electricity for heat and power (item 7), a similar procedure was used; however, the imputation parameters were geographically-based instead of industry-based. For quantities of generated less sold electricity, no imputation was performed for

non-ASM establishments. The estimates for these items are simply tabulations of unweighted ASM values.

Since the published statistics for these items were developed from the complete census universe and not just the ASM establishments, there are no sampling variances associated with these statistics. However, there is an

unknown level of bias for each of the items due to the imputation of the non-ASM establishments. This bias is felt to be small due to the strong correlation between the items being imputed and the collected items that were used to generate the impute values.



# APPENDIX B.

## Annual Survey of Manufactures (ASM) Sampling and Estimating Methodologies

### DESCRIPTION OF SURVEY SAMPLE

The Annual Survey of Manufactures (ASM) contains two components. The mail portion of the survey is a probability sample of about 56,000 manufacturing establishments selected from a total of about 220,000 establishments. These 220,000 establishments represent all manufacturing establishments of multiunit companies and all single establishment companies mailed schedules in the 1982 Census of Manufactures. This mail portion is supplemented annually by a Social Security Administration list of new manufacturing establishments opened after 1982 and a list of new multiunit manufacturing establishments identified from the Census Bureau's Company Organization Survey.

The 1984 through 1988 ASM sample differs slightly from the previous sample. For the current panel, all establishments of companies with 1982 shipments in manufacturing in excess of \$500 million were included in the survey panel with certainty. There are approximately 500 such companies collectively accounting for approximately 18,000 establishments. For the remaining portion of the mail survey, the establishment was defined as the sampling unit. For this portion, all establishments with 250 employees or more and establishments with a very large value of shipments also were included in the survey panel with certainty. A total of 12,100 establishments were selected from this portion of the universe with certainty. Therefore, of the 56,000 manufacturing establishments included in the ASM panel, approximately 31,000 are selected with certainty. These certainty establishments collectively account for approximately 80 percent of the total value of shipments in the 1982 census.

Smaller establishments in the remaining portion of the mail survey were sampled with probabilities ranging from 0.999 to 0.005 in accordance with mathematical theory for optimum allocation of a sample. The probabilities of selection assigned to the smaller establishments were proportional to measures of size determined for each establishment. The measures of size depend directly upon each establishment's 1982 product class values and the historic variability of the year-to-year shipments of each product class. Product classes displaying more volatile year-to-year change in shipments at the establishment level were sampled at a heavier rate.

This method of assigning measures of size was used in order to maximize the precision (that is, minimize the variance of estimates of the year-to-year change) in the value of product class shipments. Implicitly, it also gave weight differences in employment, value added, and other

general statistics, since these are highly correlated with value of shipments. Individual sample selection probabilities were obtained by multiplying each establishment's final measure of size by an overall sampling fraction coefficient calculated to yield a total expected sample size.

The sample selection procedure gave each establishment in the sampling frame an independent chance of selection. This method of independent selection permits the rotation of small establishments out of a given sample panel without introducing a bias into the survey estimates.

The nonmail portion of the survey includes all single-establishment companies that were tabulated as administrative records in the 1982 Census of Manufactures. Although this portion contained approximately 130,000 establishments, it accounted for less than 2 percent of the estimate for total value of shipments at the total manufacturing level. This portion was not sampled; rather, the data for every establishment in this group were estimated based on selected information obtained annually from the administrative records of the Internal Revenue Service and the Social Security Administration. This administrative-record information, which includes payroll, total employment, industry classification, and physical location of the establishment, was obtained under conditions which safeguard the confidentiality of both tax and census records. Estimates of data other than payroll and employment for these small establishments were developed from industry averages.

The corresponding estimates for the mail and nonmail establishments were added together, along with the base-year differences, as defined in the Description of Estimating Procedure section, to produce the figures shown in this publication.

### DESCRIPTION OF ESTIMATING PROCEDURES

Most of the ASM estimates for the years 1983-1986 were computed using a difference estimation procedure. For each item, a base-year difference was developed. This base-year difference is equal to the difference between the 1982 census published number for an item total and the linear ASM estimate of the total for 1982. The ASM linear estimate was obtained by multiplying each sample establishment's data by its sample weight (the reciprocal of its probability of selection) and summing the weighted values.

These base-year differences were then added to the corresponding current-year linear estimates, which include the sum of the estimates for the mail and nonmail establishments, to produce the estimates for the years 1983-1986. Estimates developed by this procedure usually are far more reliable than comparable linear estimates developed from the current sample data alone.



## QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the differences between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected statistics in this report. They are presented in the form of relative standard errors (the standard errors divided by the estimated values to which they refer).

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals (ranges that would include the comparable, complete-coverage value for specified percentages of all the possible samples).

The complete coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.
2. From two standard errors below to two standard errors above the derived estimate for about 19 of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the comparable, complete-survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence that the estimates from a particular sample would differ from complete-coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, that is, a standard error of 1,000 (2 percent of 50,000). There is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete-coverage total, about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total and almost certain confidence that the interval 47,000 to 53,000 includes the complete coverage total.

In addition to the sample errors, the estimates are subject to various response and operational errors: errors of collection, reporting, coding, transcription, imputation for nonresponse, etc. These operational errors also would occur if a complete canvass were to be conducted under the same conditions as the survey. Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Bureau's review of the data for reasonableness and consistency. The small operational errors usually remain. To some extent, they are compensating in the aggregated totals shown. When important operational errors were detected too late to correct the estimates, the data were suppressed or were specifically qualified in the tables.

As derived, the estimated standard errors included part of the effect of the operational errors. The total errors, which depend upon the joint effect of the sampling and operational errors, are usually of the order of size indicated by the standard error, or only moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the ASM is not identical to the complete coverage of the census of manufactures, as the censuses have been conducted. Nearly all types of operational errors that affect the ASM also occur in the censuses. The ASM and the censuses, are conducted under quite different conditions, and operational errors can be better controlled in the ASM than in the censuses. As a result, for many of the census figures, the errors are of the same order of size as the total errors of the corresponding annual survey estimates. The differences between the census and ASM operating conditions also disturb, to some degree, the comparability of the ASM and census data.

Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with higher-level totals, creating a broader aggregate, which then may be of acceptable reliability.

## **APPENDIX C.**

### **Metropolitan Statistical Areas**

[Titles and definitions shown for MSA's, PMSA's, and CMSA's are those established by the Office of Management and Budget, as of June 30, 1987]

#### **DISTRICT OF COLUMBIA**

##### **Washington, DC-MD-VA MSA**

District of Columbia, DC  
Calvert County, MD  
Charles County, MD  
Frederick County, MD  
Montgomery County, MD  
Prince George's County, MD  
Arlington County, VA  
Fairfax County, VA  
Loudoun County, VA  
Prince William County, VA  
Stafford County, VA  
Alexandria city, VA  
Fairfax city, VA  
Falls Church city, VA  
Manassas city, VA  
Manassas Park city, VA





## **APPENDIX D.**

### **Geographic Notes**

#### **DISTRICT OF COLUMBIA**

There are no geographic notes for the District of Columbia.



# PUBLICATION PROGRAM

## 1987 CENSUS OF MANUFACTURES

Publications of the 1987 Census of Manufactures, containing preliminary and final data on manufacturing establishments in the United States, are described below. Publications order forms for the specific reports may be obtained from any Department of Commerce district office or from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, DC 20233.

### Preliminary Reports

#### Industry series—83 reports (MC87-I-20A(P) to -39D(P))

Preliminary industry data are issued in 83 separate reports covering 459 industries. Preliminary summary data for the U.S. and States are released in one report.

### Final Reports

#### Industry series—83 reports (MC87-1-20A to -39D)

Each of the 83 reports provides information for a group of related industries ("dairy products" includes industries for butter, cheese, milk, etc.). Final figures for the United States are shown for each of the 459 manufacturing industries on quantity and value of products shipped and materials consumed, cost of fuels and electric energy, capital expenditures, assets, rents, inventories, employment, payroll, payroll supplements, hours worked, value added by manufacture, number of establishments, and number of companies. Comparative statistics for earlier years are provided where available.

For each industry, data on value of shipments, value added by manufacture, capital expenditures, employment, and payroll are shown by employment-size class of establishment, State, and degree of primary product specialization.

#### Geographic area series—51 reports (MC87-A-1 to -51)

A separate report is being published for each State and the District of Columbia. Each report presents data for industry groups and industries on value of shipments, cost of materials, value added by manufacture, employment, payroll, hours worked, new capital expenditures, and number of manufacturing establishments for the State, MSA's, counties, and selected places. Comparative statistics for earlier census years are shown for the State and large MSA's. Manufacturing totals are presented for each county and for places with significant manufacturing activity. Detailed statistics (including inventories, assets, rents, and energy costs) are presented only in statewide totals.

#### Subject series—7 reports (MC87-S-1 to -7)

Each of the seven reports contains detailed statistics for an individual subject, such as concentration ratios in manufacturing, type of organization, water use in manufacturing, textile machinery in place, distribution of sales by class of customer, manufacturers' shipments to the Federal Government, and a general national-level summary.

#### Reference series—1 report (MC87-R-1)

The Numerical List of Manufactured and Mineral Products includes a description of the principal products and services published in the 1987 Censuses of Manufactures and Mineral Industries.

## Location of Manufacturing Plants—1 report (MC87-LM)

This report includes data for number of establishments by four-digit SIC industry and by employment-size class for counties, incorporated places of 2,500 inhabitants or more, and zip codes for each State. (This report is available only on magnetic tape and CD-ROM.)

## Analytical Reports—3 reports (AR87-1 to -3)

### Exports From Manufacturing Establishments (AR87-1)

This report presents data on exports by two- and three-digit SIC industry groups for the United States and States. Information is presented on value of direct report shipments and estimates of the employment required to manufacture these products. Included are estimates of employment in manufacturing and nonmanufacturing establishments that supply parts, materials, and services for production of manufactured exports.

### Selected Characteristics of Manufacturing Establishments That Export (AR87-2)

This report presents data on the number of manufacturing companies and establishments that export by major group, State, employment size, and ratios of exports to shipments.

### Indexes of Production (AR87-3)

The indexes presented in this report are designed to measure the change in physical output of each manufacturing and mineral industry between 1982 and 1987.

## MICROFICHE

Every final published report in the 1987 Census of Manufactures will be available on microfiche.

## PUBLIC-USE COMPUTER TAPES AND COMPACT DISCS

Data from the final industry series, geographic area series, and the Location of Manufacturing Plants report will be available on public-use computer tapes and compact discs—read only memory (CD-ROM). These tapes will provide the same information found in the final reports. Computerized data products are available for users who wish to summarize, rearrange, or process large amounts of data. These products, with corresponding technical documentation, are sold by Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, DC 20233.

## OTHER ECONOMIC CENSUSES REPORTS

Data on retail trade, wholesale trade, service industries, construction industries, mineral industries, transportation, enterprise statistics, minority-owned businesses, and women-owned businesses also are available from the 1987 Economic Censuses. A separate series of reports covers the censuses of outlying areas—Puerto Rico, Virgin Islands of the United States, Guam, and the Northern Mariana Islands. Separate announcements describing these reports are available free of charge from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, DC 20233.





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